

2SK1521-E1-E

450V - 50A - MOS FET
High Speed Power Switching

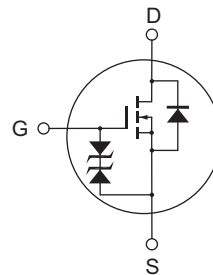
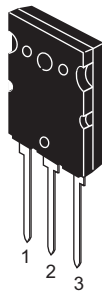
R07DS1194EJ0300
Rev.3.00
Mar 26, 2014

Features

- Low on-resistance
 $R_{DS(on)} = 0.08 \Omega$ typ. (at $I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$, $T_a = 25^\circ\text{C}$)
- High speed switching
- Low drive current
- Built-in fast recovery diode ($t_{rr} = 120 \text{ ns}$)
- Suitable for motor control, switching regulator, DC-DC converter

Outline

RENESAS Package code: PRSS0003ZC-A
(Package name:TO-264)



1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	450	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D	50	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	200	A
Body to drain diode reverse drain current	I_{DR}	50	A
Channel dissipation	P_{ch} ^{Note2}	250	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
2. Value at $T_C = 25^\circ\text{C}$

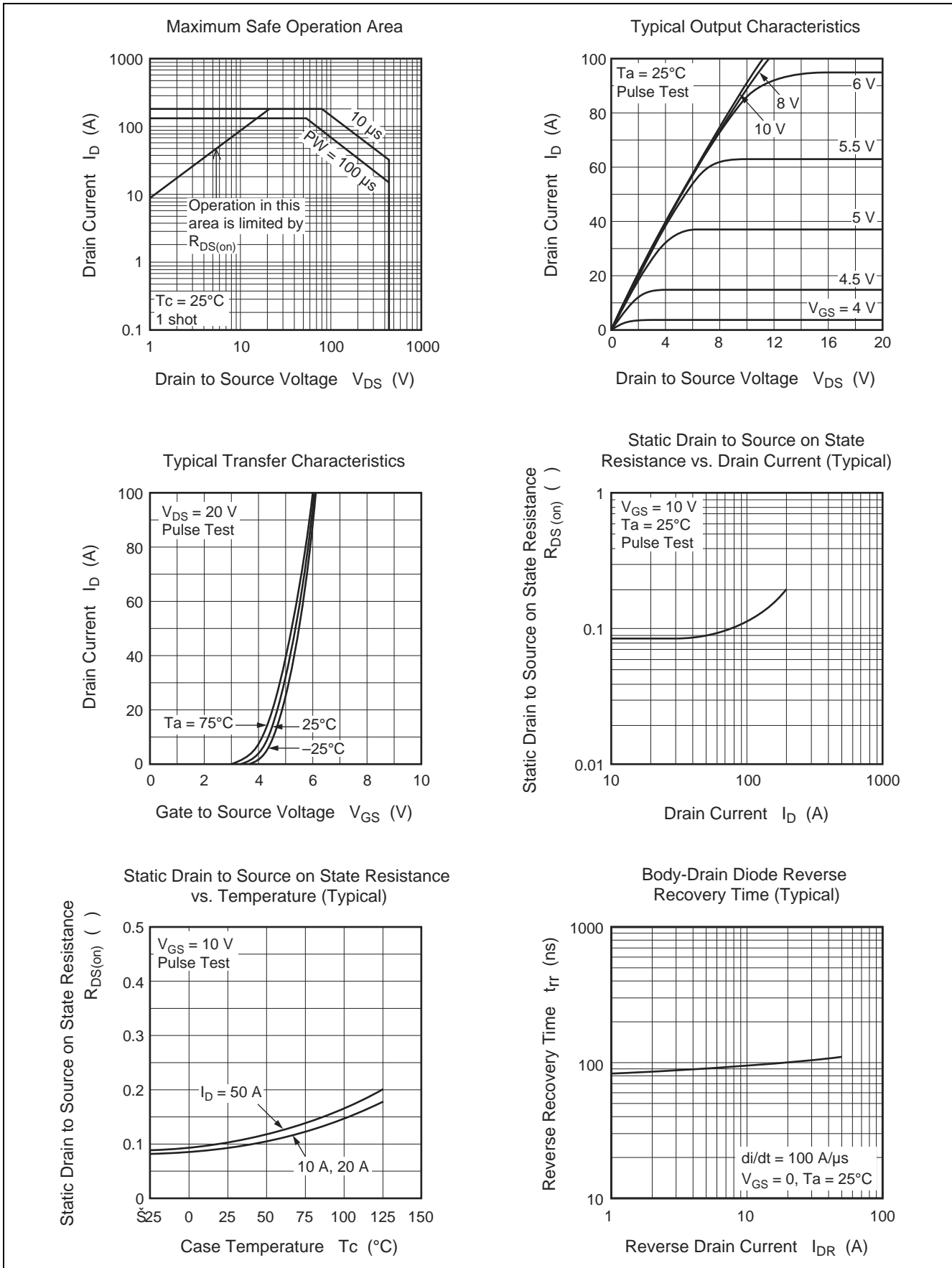
Electrical Characteristics

(Ta = 25°C)

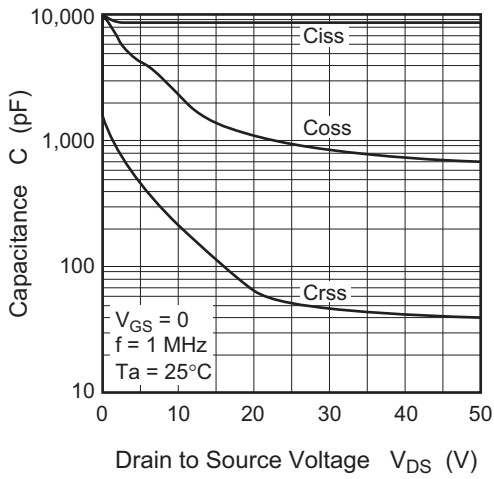
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	450	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 30	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	250	μA	$V_{DS} = 360 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.08	0.10	Ω	$I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	22	35	—	S	$I_D = 25 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	8700	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	2400	—	pF	$V_{GS} = 0$,
Reverse transfer capacitance	C_{rss}	—	235	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	85	—	ns	$I_D = 25 \text{ A}$
Rise time	t_r	—	250	—	ns	$V_{GS} = 10 \text{ V}$,
Turn-off delay time	$t_{d(off)}$	—	600	—	ns	$R_L = 1.2 \text{ }\Omega$
Fall time	t_f	—	250	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.1	—	V	$I_F = 50 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	120	—	ns	$I_F = 50 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 3. Pulse test

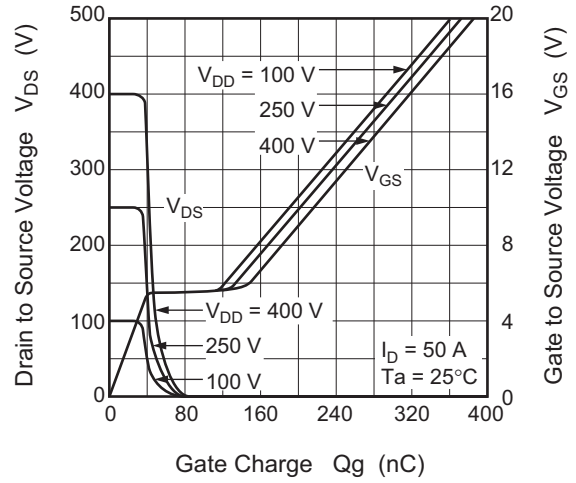
Main Characteristics



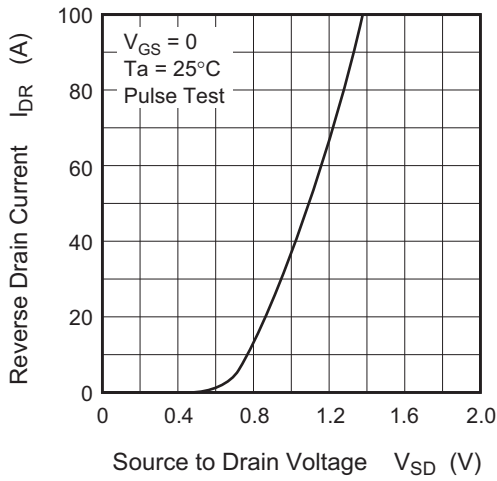
Typical Capacitance vs. Drain to Source Voltage

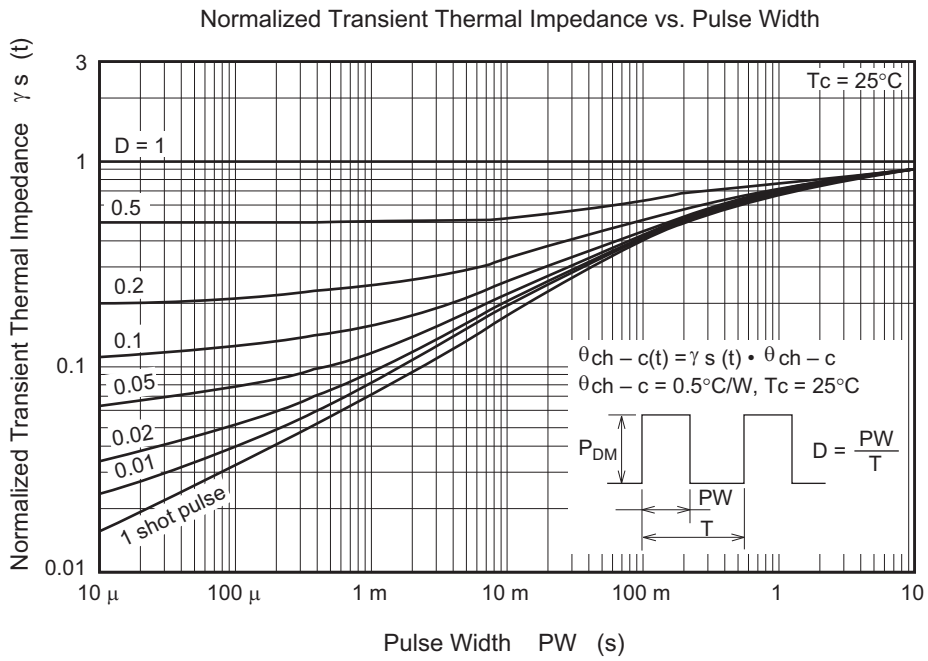


Dynamic Input Characteristics (Typical)

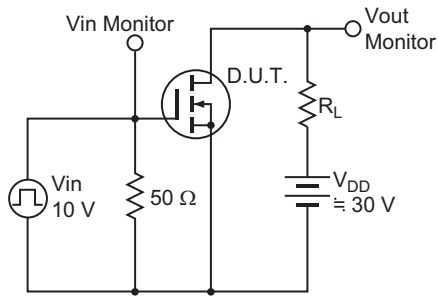


Reverse Drain Current vs. Source to Drain Voltage (Typical)

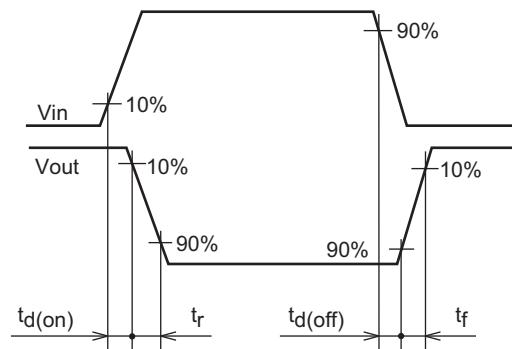




Switching Time Test Circuit



Waveform



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